



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/549,762	09/19/2005	Shinji Kawasaki	28953.7283	8406

27890 7590 09/10/2007
STEPTOE & JOHNSON LLP
1330 CONNECTICUT AVENUE, N.W.
WASHINGTON, DC 20036

EXAMINER

ROBINSON, LAUREN E

ART UNIT	PAPER NUMBER
----------	--------------

1709

MAIL DATE	DELIVERY MODE
-----------	---------------

09/10/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/549,762	KAWASAKI ET AL.	
	Examiner	Art Unit	
	Lauren E.T. Robinson	1709	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 12-31 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Election/Restrictions

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions, which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group 1, claim(s) 12-21, drawn to the article.

Group 2, claim(s) 22-31, drawn to the method for making the article.

2. The inventions listed as Groups 1 and 2 do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The article of Group 1 is known in the prior art of US Publication No. 2002/0066233 with the limiting characteristics proposed by the applicants found obvious using WO No. 2002/026351.

McArdie et. al. in US Publication No. 2002/0066233 teach ceramic aggregate particles comprising a plurality of solid particulates such as silicon carbide (Pg. 2, Col. 2, Par. 0028) bound together by silicon nitride (Pg. 2, Col. 1,

Art Unit: 1709

Par. 0022) or a ceramic binder precursor material made of glass powder in the form of Al_2O_3 (Pg. 5, Col. 2, Par 0058) that improves porosity in between the particles (Pg. 3, Col. 2, Par. 0035). It is also possible is this reference that the silicon carbide can have a surface coating to improve adhesion (Pg. 3, Col. 1, Par. 0032). McArdie et. al. also teach that the binding material can be made by heating at a temperature in between 900 to 1400°C (Pg. 5, Col. 2, Par. 3), have a pore diameter ranging from 0.07 to about 900 micrometers (Pg. 20, Col. 1, Par. 1) and a porosity of 40% (Pg. 10, Col. 1, Par. 0102). While McArdie et. al. teach silicon carbide particles bound by silicon nitride to form pores where Al_2O_3 can be used as a precursor around the particles and the binding material is heated, they are **silent with regard to the specific surface area of the said pores, the heat resistant temperature, and gas permeability.**

Ohno et. al. teach a catalyst holding filter made of a ceramic support of silicon carbide covered with a catalyst layer. The average pore size is between 10 to 250 micrometers and the porosity % is between 40 to 80% (abstract). The said ceramic support can be made of silicon nitride or silicon carbide and are treated at high temperatures (Pg. 6, Col. 1, Par. 0094) to increase the heat resistance (Pg. 2, Col. 1, Par. 0024). When below 800°C an oxidation reaction does not happen but above 1600°C it happens too rapidly, therefore it is the reference's preference to heat between 100-1500°C (Pg. 9, Col. 1, Par. 0130). By using this temperature, Ohno et. al. is able to resist deterioration effect of the elevated temperature (heat resistance). Also in this reference, the surfaces of the silicon carbide particles are covered with a covering layer (Pg. 3, Col. 1, Par.

Art Unit: 1709

0053) such as Al_2O_3 (Pg. 7, Col. 2, Par. 0114) and the pores formed between particles catch fine particles (Pg. 3, Col. 2, Par. 0061) such as soot and the said pores have a specific surface area of $0.12 \text{ m}^2/\text{g}$ (Pg. 5, Col. 2, Par. 0085). When the said pores in this reference are too small (10 micrometers), pressure loss is increased but when the said pores are too large (250 micrometers), the soot clogs the gas passing pores (Pg. 1, Col. 2, Par. 0018). Therefore, the said pores in this reference have a gas permeability that is either large when the diameter is small or small with the diameter is large. While Ohno et. al. teach the catalyst holding filter made of silicon carbide or silicon nitride with a binder and a Al_2O_3 coating to create gas permeability, heat resistance, and pores, they are **silent with regard to the binder being silicon nitride, and the gas permeability being that of $1 \mu\text{m}^2$.**

Although McArdie et. al. is silent with regard to the specific surface area of the said pores, both references use Al_2O_3 around the silicon carbide particles to form the said pores between the silicon carbide and binder and since the specific surface area of the pores is less than $1 \text{ m}^2/\text{g}$ in Ohno et. al.'s teaching, it would have been obvious to one with ordinary skill in the art at the time the invention was made to modify McArdie et. al.'s teaching to include a specific surface area less than $1 \text{ m}^2/\text{g}$. Also, although McArdie et. al. is silent with regard to heat resistant temperature, it would have been obvious to modify the teaching using the temperature 1500°C in Ohno et. al.'s disclosure since both teachings use the same particulate material and heat resistance is defined as the ability to resist deterioration effects of elevated temperatures and this elevated temperature in

Art Unit: 1709

Ohno et. al.'s teaching is 1600°C or higher. Furthermore, while McArdie et. al. is silent with regard to gas permeability, Ohno et. al. teach that silicon carbide and silicon nitride increase gas permeability and the pores such as the ones formed in McArdie et. al.'s teaching, collect particles such as soot and if the pore diameter is at 10 micrometers, which is taught by both references, then too much gas will flow through the pores and if the pores are at 250 micrometers, which is taught by both references, then not much gas flow can occur. Due to this permeability of gas occurring at either a small amount or a large amount in this reference, it would have been obvious to one of ordinary skill in the art to use a permeability factor as small (or larger than 1 μm^2) as the one claimed by the applicants' in Ohno et. al.'s teaching and then it would have been further obvious to modify McArdie et. al.'s teaching to include gas permeability of 1 μm^2 or more.

Therefore, the article of Group 1 is not the applicants' contribution over the prior art and the article is further determined to not be a special technical feature causing a lack of unity between claims 12-21 (Group 1) and 22-31 (Group 2).

3. A telephone call was made to Roger Parkhurst on August 23, 2007 to request an oral election to the above restriction requirement, but did not result in an election being made.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the

Art Unit: 1709

requirement be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention or species may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

Should applicant traverse on the ground that the inventions or species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions or species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C.103 (a) of the other invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lauren E.T. Robinson whose telephone number is (571) 270-3474. The examiner can normally be reached on Mon. through Fri. 7:30 to 5:00 EST (First Fri Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, D. Lawrence Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1709

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

D. LAWRENCE TARAZANO
PRIMARY EXAMINER



Lauren E.T. Robinson
Examiner
Art Unit 1709

